



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------------------------------------------------------------------------------|-------------|----------------------|---------------------|-------------------|
| 10/605,678 | 10/17/2003 | Jin-Tau Huang | NTCP0016USA | 2677 |
| 27765 | 7590 | 03/06/2006 | EXAMINER | |
| NORTH AMERICA INTELLECTUAL PROPERTY CORPORATION P.O. BOX 506 MERRIFIELD, VA 22116 | | | | EVERHART, CARIDAD |
| | | ART UNIT | | PAPER NUMBER |
| | | 2891 | | |

DATE MAILED: 03/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | |
|------------------------------|-----------------|--------------|
| Office Action Summary | Application No. | Applicant(s) |
| | 10/605,678 | HUANG ET AL. |
| Examiner | Art Unit | |
| Caridad M. Everhart | 2891 | |

— The MAILING DATE of this communication appears on the cover sheet with the correspondence address —
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 19 December 2005.
 2a) This action is FINAL. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1 and 4-15 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) Claim(s) 10-15 is/are allowed.
 6) Claim(s) 1 and 4-9 is/are rejected.
 7) Claim(s) _____ is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

| | |
|-------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____. |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____. | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| | 6) <input type="checkbox"/> Other: _____. |

Response to Arguments

Applicant has argued that Ota does not disclose the use of the layer 3A as a mask but rather as an etch stop layer. This argument is respectfully found to be not persuasive because it is seen in Fig. 14^{that} layer 15 is used as a mask. Layer 15 is a silicide; however, claim 1 requires only that the layer used as a mask is a passivation layer, and silicide can be used as a passivation layer for metal. In addition, with respect to the arguments that the other references do not teach using a layer as a mask, the rejection is made using the references in combination.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1,6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liaw (US 6,448,140B1) in view of Gocho(US 6,258,654B1) and further in view of Ota et al (US 6,521,963B1).

Liaw discloses depositing a silicon dioxide gate insulator, a polysilicon layer, a tungsten silicide layer, and a hardmask of silicon nitride(col. 3,lines 50-65). These layers are etched to form a gate(col. 4,lines 6-15). The tungsten silicide layer is laterally recessed(col. 4,lines 57-67). Passivation is filled into the recess(col. 5,lines 30-35 and Fig. 4-features 9c). Photoresist is used to pattern the cap layer and the entire stack(col.

4,lines 13-20) . APM is used to form the recesses (col. 4,lines 64-67). Spacers are formed from silicon nitride by anisotropic etch(col. 5,lines 20-36).

Liaw does not carry out the etch in two steps nor teach the stopping the etch at the polysilicon layer.

Gocho(US 6,258,654B1) is relied upon for its teaching of carrying out a tungsten silicide polycide etch in two steps, such that the polysilicon acts as an etch stop(col. 5,lines 65-67 and col. 6,lines 1-11).

Ota et al teaches stopping the etch at the polysilicon layer in a process of forming an oxide in an indentation of a metal layer overlying the polysilicon(Fig. 14 and Fig.20 and col. 12, lines 62-67).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have used the two-step etch taught by Gocho in the process taught by Liaw because Liaw discloses that conventional etch procedures can be used, and the procedure used by Gocho would include the protection of the polysilicon layer while the tungsten nitride layer is being processed.

It would have been obvious to one of ordinary skill in the art at the time of the invention to have combined the step taught by Ota in the process taught by Liaw in view of Gocho in order to protect the polysilicon layer.

Claims 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liaw in view of Gocho and of Ota et al as applied to claim 1 above, and further in view of Curello(US 6,503,844B2).

Liaw in view of Gocho and of Ota et al does not teach removing the photoresist in order to use the cap layer as a hardmask.

Curello discloses the step of removing the photoresist in order to use the cap layer as a hardmask(col. 4, lines 15-25 and Fig. 3A, feature 54 is the hardmask).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have combined the steps taught by Curello with the process taught by Liaw because the cap layer in the process taught by Liaw could have been used as a hardmask without the photoresist layer remaining on the patterned cap layer, and the material of the cap is the same in the process taught by Liaw and in the steps taught by Curello.

Allowable Subject Matter

Claims 10-15 are allowed.

The prior art of record does not teach or suggest the anisotropic etch to remove the fill layer of the recess except that in the recess, in combination with the other limitations of the claims.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

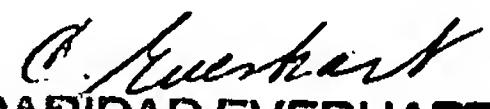
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Caridad M. Everhart whose telephone number is 571-272-1892. The examiner can normally be reached on Monday through Fridays 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, B. Baumeister can be reached on 571-272-1722. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


CARIDAD EVERHART
PRIMARY EXAMINER

C. Everhart
2-27-2006